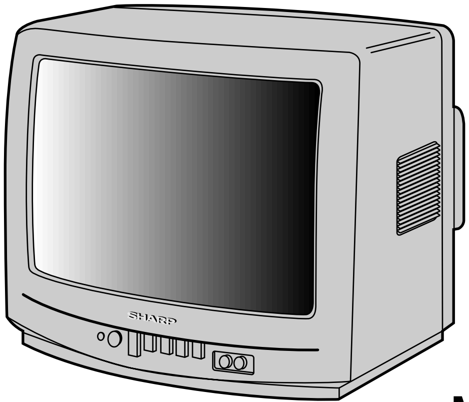
SHARP SERVICE MANUAL

S28L513K-M100



COLOR TELEVISION

Chassis No. SN-80

13K-M100/150
MODELS CK13M10/15

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

ELECTRICAL SPECIFICATIONS

POWER INPUT .... 120 V AC 60 Hz
POWER RATING .... 69 W
PICTURE SIZE .... 580cm^2(89.9sq inch)
CONVERGENCE .... Magnetic
SWEEP DEFLECTION .... Magnetic
FOCUS....................... Hi-Bi-Potential Electrostatic
INTERMEDIATE FREQUENCIES
- Picture IF Carrier Frequency............. 45.75 MHz
- Sound IF Carrier Frequency .... 41.25 MHz
- Color Sub-Carrier Frequency .... 42.17 MHz (Nominal)

AUDIO POWER
- OUTPUT RATING .... 0.9W (at 10% distortion)

SPEAKER
- SIZE .... 8cm(Round)
- VOICE COIL IMPEDANCE .... 8ohm at 400 Hz

ANTENNA INPUT IMPEDANCE
- VHF/UHF ....75 ohm Unbalanced

TUNING RANGES
- VHF-Channels 2thru 13
- UHF-Channels 14thru 69
- CATV Channels....................................1thru 125
- USA: (EIA, Channel Plan)

Specifications are subject to change without prior notice.

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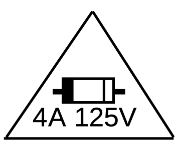
SHARP CORPORATION

IMPORTANT SERVICE SAFETY PRECAUTION

■ **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulation material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit.The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
   To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.



CAUTION: FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A-125V FUSE.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation if the high voltage is as specified in the "High Voltage Check" instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that service personal have available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and; also under certain conditions, may produce radiation that exceeds specifications.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
   Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

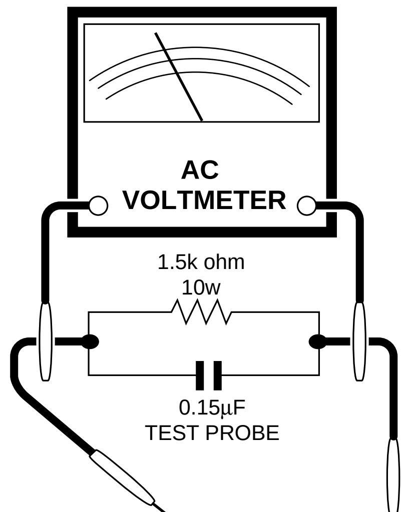
RETBEFOREURNING THE RECEIVER

(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 120 volt AC outlet, (Do not use an isolation transformer for this test).
- Using to clip leads, connect a 1.5k ohm, Iê watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis
(antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.
AII check must be repeated with the AC line cord plug connection reversed. (IF necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)
Any current measured must not exceed 0.5 milliamp.
Any measurements not within the limits outlined above are indicative of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics.
These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

For continued protection, replacement parts must be identical to those used in the original circuit.

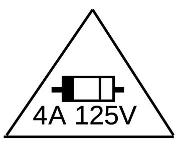
The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

PRECAUTIONS A PRENDRE LORS DE LA REPARATION

■ **Ne peut effectuer la réparation qu' un technicien spécialisé qui s'est parfaitement accoutumé à toute vérification de sécurité et aux conseils suivants.**

AVERTISSEMENT

1. N'entreprendre aucune modification de tout circuit. C'est dangereux.
2. Débrancher le récepteur avant toute réparation.
3. Les déversoirs thermiques à semi-conducteurs peuvent présenter un danger de choc électrique lorsque le réceqteur est en marche.
4. Le châssis de ce récepteur possède deux systèmes de masse qui sont séparées par du matériel d'isolation. Le système de masse non-isolée (sous tension) est pour le circuit du régulateur de tension + B et le circuit de sortie horizontale. Le système de masse isolée est pour les tensions DC + B basses et le circuit secondaire du transformateur haute tension. Pour éviter tout risque d'électrocution lors de l'entretien de ce châssis, utiliser un transformateur d'isolation entre le cordon de ligne et la prise de courant.



PRECAUTION:POUR LA PROTECTION CONTINUE CONTRE LES RISQUES D'INCENDIE, REMPLACER LE FUSIBLE PAR UN FUSIBLE DE MEME TYPE 4A-125V.

REPARATION DU SYSTEME A HAUTE TENSION ET DU TUBE-IMAGE

Lors de la réparation de ce systéme, supprimer la charge statique en branchant une résistance de 10 kΩ en série avec un fil isolé (comme une sonde d'essai) entre la mise à la terre du tube-image et le fil d'anodel. (Le corden d'alimentation doit être retiré de la prise murale.)

1. Le tube image dans ce récepteur emploie une protection intégrée contre l'implosion.
2. Par mesure de sécurité, changer le tube-image pour un tube du même numéro de type.
3. Ne pas lever le tube-image par son col.
4. Ne manipuler le tube-image qu'en porant des lunettes incassables et qu'après avoir déchargé totalement la haute tension.

LIMITES DES RADIATIONS X ET DE LA HAUTE TENSION

1. Tout le personnel réparateur doit être instruit des instructions et procédés relatifs aux radiations X.
   Le tube-image, seule source de rayons X dons les téleviseurs transistorisés, n'émet pourtant pas de rayons mesurables si la haute tension est maintenue à un niveau préconisé dans la section "Vérification de la haute tension".
   C'est seulement quand la haute tension est excessive que les rayons X peuvent entrer dans l'enveloppe du tube-image y compris le conducteur de verre. Il est important de maintenir la haute tension en-dessous du niveau spécifié.
2. Il est essentiel que le réparateur ait sous la main un voltmètre à haute tension qui doit être périodiquement étalonné.
3. La haute tension doit toujours être maintenue à la valeur de régime -et pas plus haute. L'opération à des tensions plus élevées peut entraîner une panne du tube-image ou du circuit à haute tension et, dans certaines conditions, peut entraîner une radiation dépassant les niveaux préscrits.
4. Quand le régulateur à haute tension fonctionne correctement, il n'y a aucun problème de radiation X. Chaque fois qu'un châssis couleurs est réparé, la luminosité doit être examinée bout en contrôlant la haute tension à l'aide d'un voltmètre pour s'assurer que la haute tension ne dépasse pas la valeur spécifiée et qu'elle soit correctement réglée.
5. Ne pas utiliser un tube-image autre que celui spécifié et ne pas effectuer de modifications déconseillées du circuit à haute tension.
6. Lors de la recherche des pannes et des mesures d'essai sur un récepteur qui présente une haute tension excessive, éviter de s'approcher inutilement du récepteur.
   Ne pas faire fonctionner le récepteur plus longtemps que nécessaire pour localiser la cause de la tension excessive.

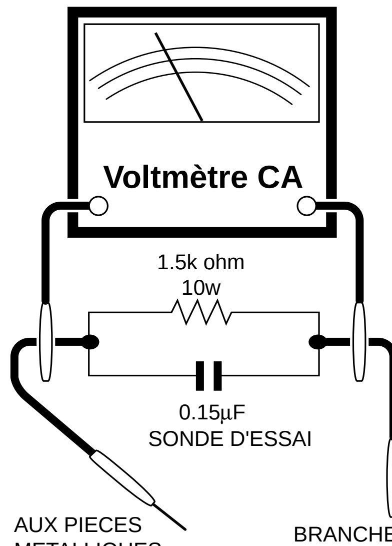
PRECAUTIONS A PRENDRE LORS DE LA REPARATION
(Suite)

VERIFICATIONS CONTRE L'INCEN-DIE ET LE CHOC ELECTRIQUE

Avant de rendre le récepteur à l'utilisateur, effectuer les vérifications suivantes.

1. Inspecter tous les faisceaux de câbles pour s'assurer que les fils ne soient pas pincés ou qu'un outil ne soit pas placé entre le châssis et les autres pièces métalliques du récepteur.
2. Inspecter tous les dispositifs de protection comme les boutons de commande non-métalliques, les isolants, le dos du coffret, les couvercles ou blindages de réglage et de compartiment, les réseaux de résistance-capacité, les isolateurs mécaniques, etc.
3. S'assurer qu'il n'y ait pas de danger d'électrocution en vérifiant la fuite de courant, de la facon suivante:

- Brancher le cordon d'alimentation directem-ent à une prise de courant de 120V. (Ne pas utiliser de transformateur d'isolation pour cet essai).
- A l'aide de deux fils à pinces, brancher une résistance de 1,5 kΩ 10 watts en parallèle avec un condensateur de 0,15µF en série avec toutes les pièces métalliques exposées du coffret et une terre connue comme une conduite électrique ou une prise de terre branchée à la terre.
- Utiliser un voltmètre CA d'une sensibilité d'au moins 5000Ω/V pour mesurer la chute de tension en travers de la résistance.
- Toucher avec la sonde d'essai les pièces métalliques exposées qui présentent une voie de retour au châssis (antenne, coffret métallique, tête des vis, arbres de commande et des boutons, écusson, etc.) et mesurer la chute de tension CA en-travers de la résistance. Toutes les vérifications doivent être refaites après avoir inversé la fiche du cordon d'alimentation. (Si nécessaire, une prise d'adpatation non polarisée peut être utilisée dans le but de terminer ces vérifications.)
  Tous les courants mesurés ne doivent pas dépasser 0,5 mA.
  Dans le cas contraire, il y a une possibilité de choc électrique qui doit être supprimée avant de rendre le récepteur au client.



AVIS POUR LA SECURITE

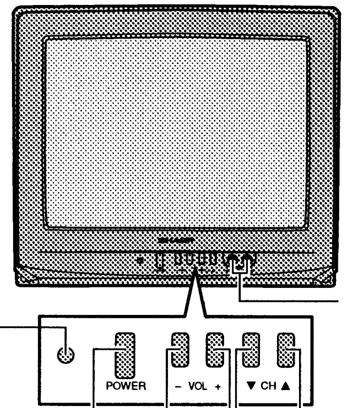
De nombreuses pièces, électriques et mécaniques, dans les téléviseurs présentent des caractéristiques spéciales relatives à la sécurité, qui ne sont souvent pas évidentes à vue. Le degré de protection ne peut pas être nécessairement augmentée en utilisant des pièces de remplacement étalonnées pour haute tension, puissance, etc.
Les pièces de remplacement qui présentent ces caractéristiques sont identifiées dans ce manuel; les pièces électriques qui présentent ces particularités sont identifiées par la marque " ⚠ " et hachurées dans la liste des pièces de remplacement et les diagrammes schématiques.
Pour assurer la protection, ces pièces doivent être identiques à celles utilisées dans le circuit d'origine. L'utilisation de pièces qui n'ont pas les mêmes caractéristiques que les pièces recommandées par l'usine, indiquées dans ce manuel, peut provoquer des électrocutions, incendies, radiations X ou autres accidents.

LOCATION OF USER'S CONTROL

Quick Reference Control Operation

■ Location of Controls (ENGLISH)

Front Panel



VIDEO/AUDIO IN TERMINALS

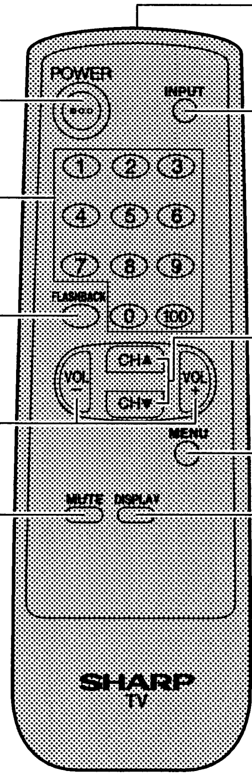
SENSOR AREA FOR REMOTE CONTROL

POWER
Press → On.
Press again → Off.

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.

Basic Remote Control Functions



Infrared Transmitter Window

POWER
Press → On.
Press again → Off.

REMOTE KEYPAD
Accesses any channel from keypad.

FLASHBACK
Returns to previous channel.

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.
- In menu mode, changes or selects the TV adjustments.

MUTE
Press → Mutes sound.
Press again → Restores sound.
- CLOSED CAPTION appears when sound is muted.

INPUT
Press → Switch to external video input mode.
Press again → Switch to TV mode.

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.
- Moves the " ⬍" mark of the MENU screen.

MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.

DISPLAY
Press → Displays receiving channel for 4 seconds.
Press again → Removes display.
- Temporarily displays receiving channel when in Closed Caption mode.

INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdriver or TV alignment tools.

(2) Before performing adjustment, TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 4.0A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

1. After service has been performed on the horizontal deflection system, high voltage system, B + system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1) Apply 120V AC using a variac transformer for accurate input voltage.
2) Allow for warm up and adjust all customer controls for normal picture and sound.
3) Select a local channel.
4) Connect a digital voltmeter to TP653 and make sure that the voltmeter reads 21.3V ±1.5V.
5) Apply external 28.9V DC at TP653 by using an external DC supply, TV must be shut off.
6) To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652.Now make sure that normal picture appears on the screen.
7) If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checke to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 120V AC line voltage, with strong air signal or properly tuned in test signal.
3. Set service mode on (See next page.),Service No.S19 and Bus data "01" (Y-mute on).
4. The voltage should be approximately 24.0kV (at zero beam)."
   If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test,make Y-mute off (normal mode).

For adjustments of this model, the bus data is convered to various analog signals by the D-A converter circuit.
Note: There are still a few analog adjustments in this series such as focus and master screen voltage.

Follow the steps below whenever service adjustment is required. See Figure "B" to determine if service adjustments are required.

1.Service mode -

Before putting unit into the service mode, check, that customer adjustments are in the normal mode. use the reset function in the video adjust menu to ensure customer controls are in their

2.Service number selection

Once in the service mode, press the channel up or channel down button on the remote transmitter or at the set. the service adjustment number will vary in increments of one, from "S01" to "S19".
Select the item you wish to adjust.

3.Data number selection

Press the volume up or down button to adjust the data number.

To enter the service mode .

While Pressing the Vol-up and Ch-up buttons at once,plug the AC cord into a wall socket.Now the TV set is switched on and enters the service mode.
To exit the service mode, shut the television off by pressing the power button.

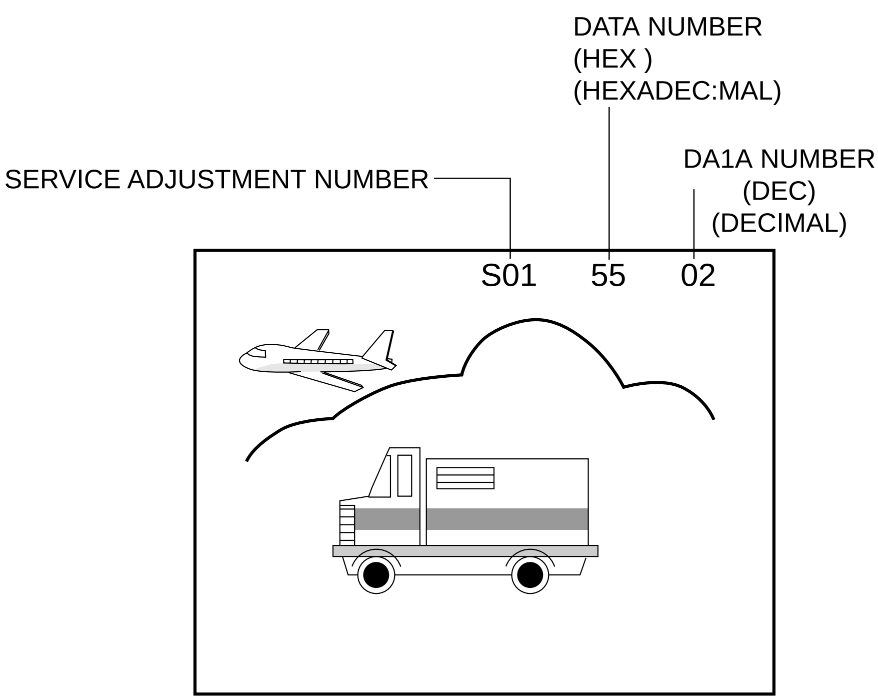


Figure B.

SERVICE NUMBER	ADJUSTMENT ITEM	DATA		ADJUSTMENT CONTENTS
		INITIAL VALUE	RANGE	
S01	PICTURE	55	00-7F	
S02	TINT	46	00-7F	
S03	COLOR	32	00-7F	
S04	BRIGHTNESS	40	00-7F	
S05	SHARPNESS	28	00-3F	Must be set to “24”
S06	VERTICAL PHASE	00	00-07	Must be set between "0" to "03"
S07	HORIZONTAL PHASE	12	00-1F	
S08	RF-AGC	2A	00-3F	
S09	VERTICAL AMP	20	00-3F	
S10	VCO	2C	00-7F	
S11	R CUT-OFF	00	00-FF	
S12	G CUT -OFF	00	00-FF	
S13	B CUT-OFF	00	00-FF	
S14	G GAIN	7F	00-FF	
S15	B GAIN	7F	00-FF	
S16	TRAP(3.58MHz)	00	00 or 01	Must be set to “00”
S17	BALANCE	20	00-3F	Must be set to “20”
S18	C.C.POSITION	18	00-7F	
S19	Y-MUTE	00	00,01,03	00=NORMAL, 01=no”Y, 03=NO VERTICAL”

Table - A

Holding down both the CH UP/DOWN keys on the TV set at service mode for more then 2 seconds will automatically write the above initial values into IC2101.

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC2001		X	Data is stored in IC2101.
IC201	X		The adjustment is needed to compensate for characteristics of parts including IC201.
IC2101	X		Holding down both the CH UP/DOWN keys on the TV set at service mode for more than 2 seconds will automatically write the above initial values into IC2101.
CRT	X		Adjust items related to picture tube only.

Table - B

■ adjustment

VCO Adjustment

1. Connect a digital voltmeter between pin (44) of IC201 and ground.
2. Select a good local channel.
3. Enter the service mode. select adjustment "S10".
4. Adjust the data so that digital voltmeter should read 2.2V
5. Adjustment is complete, remove the volt-meter, return to "normal" mode.

RF AGC Adjustment

1. Have unit receive a good local channel.
2. Enter the service mode and select service adjustment "S08".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

NOTE 1 :You will have to come out of the service mode to select another channel.

NOTE 2 :Setting the data to "00" will pro-duce a black raster.

Screen adjustment

1. Connect a digital voltmeter between TP852 and TP853 on the CRT socket PWB.

Note:These test points may not be provided.
Then connect the voltmeter to both ends of R852 located near Q852 on the foil side.

2. Select a good local channel.
3. Enter the service mode and select service adjustment “S03” and set the data value to “00” to set the color level to minimum.(Record original data code under adjustment “S03” before changing) You may skip this step if you selected a B/W picture or monoscope pattern.
4. Select service adjustment “S19” and adjust the data value to “01” this turn off the luminance signal (Y-mute).
5. Select service adjustment "S04" and adjust data value to obtain 0.17 volts on the digital voltmeter.
6. Adjust the master screen cotrol untill raster darkens to the point where raster is barely seen.
7. Adjust service adjustments "S11" red, "S12" green and "S13" blue to obtain a good grey scale with normal whites at low brightness level.
8. Select service adjustment “S19” and reset data to “00”.
   Select service adjustment “S03” and reset data to obtain normal color level.
9. Remove digital voltmeter.
   Reset master screen cotrol to obtain normal brightness range.

White balance adjustment

1. Have unit receive a good local channel.
2. Enter the service mode. select service adjustment "S03" and set to "00" (minimum color) . "S03" does not have to be adjusted if you selected a B/W picture or monoscope pattern.
3. Alternately adjust service adjustment data of "S14" and "S15" untill a good grey scale with normal whites is obtained.
4. Select service adjustment "S03" and adjust data to obtain normal color level.

Sub-picture adjustment

1. Have unit receive a good local channel.
2. Make sure the customer picture control is set to maximum.
3. Enter the service mode and select service adjustment "S01".
4. Adjust the data value to achieve normal contrast range.

Sub-Tint Adjustment

1. Have unit receive a good local channel.
2. Set customer tint control to center of it's range.
3. Enter the service mode and select service adjustment "S02".
4. Adjust "S 02" data value to obtain normal flesh tones.

Sub-color adjustment

1. Have unit receive a good local channel.
2. Make sure the customer color control is set to center position .
3. Enter the service mode and select service adjustment "S03".
4. Adjust "S03"data value to obtain normal color level.

Sub-brightness adjustment

1. Have unit receive a good local channel.
2. Make sure the customer brightness control is set to center position.
3. Enter the service mode and select service adjustment "S04".
4. Adjust "S04"data value to obtain normal brightness level.

Vertical-size adjustment

1. Have unit receive a good local channel.
2. Enter the service mode and select service adjustment "S09".
3. While observing the top and bottom of the screen, adjust "S09" data value to proper vertical size .

Vertical phase adjustment

1. Enter the service mode and select service adjustment "S06".
2. Adjust data value to "00"~"03" so that picture is approximate center.

Note: This must be set "00"~"03" when adjust another data retrace line will be appear.

Horizontal position adjustment

1. Have unit receive a good local channel.
2. Enter the service mode and select service adjustment "S07".
3. Adjust "S07" data value so that picture is centered.

Caption position adjustment (horizontal)

1. Have unit receive a good local channel.
2. Enter the service mode and select service adjustment "S18".
3. A black text box appears on the screen (see Figure C) .
4. Adjust "S18" data value so that text box is positioned in the center of the screen.

3.58MHz trap adjustment

1. Have unit receive a good local channel.
2. Enter the service mode and select service adjustment "S16" .
3. This is a two position adjustment, "00" is ON , "01" is OFF.
4. Adjust data value to "00" for normal viewing.

Sharpness and Audio balance adjustments

1. Have unit receive a good local channel.
2. Enter the service mode and select "S05" for sharpness and "S17" for balance.

- Sharpness adjustments

3. Adjust data value to "24" (center of data range) for sharpness adjustment.

- Audio balance adjustments

4. Adjust data value to "20" (center of data range) for Audio balance adjustment.

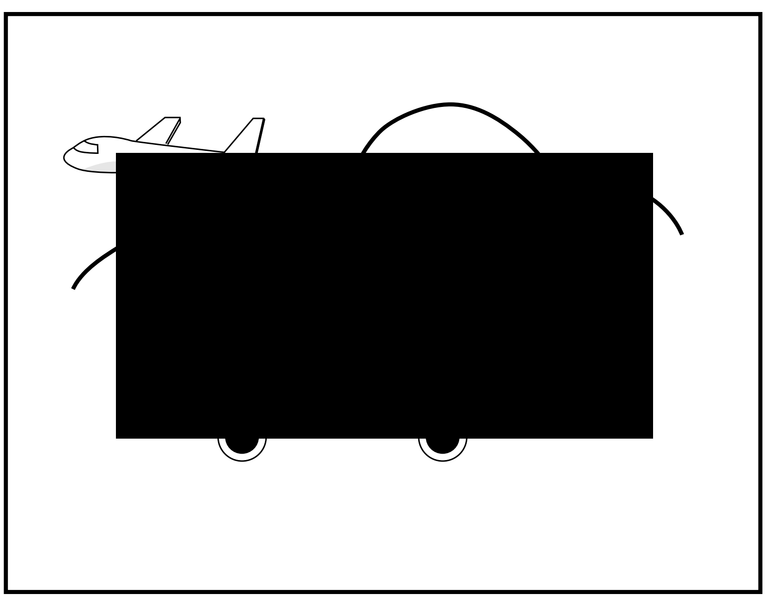
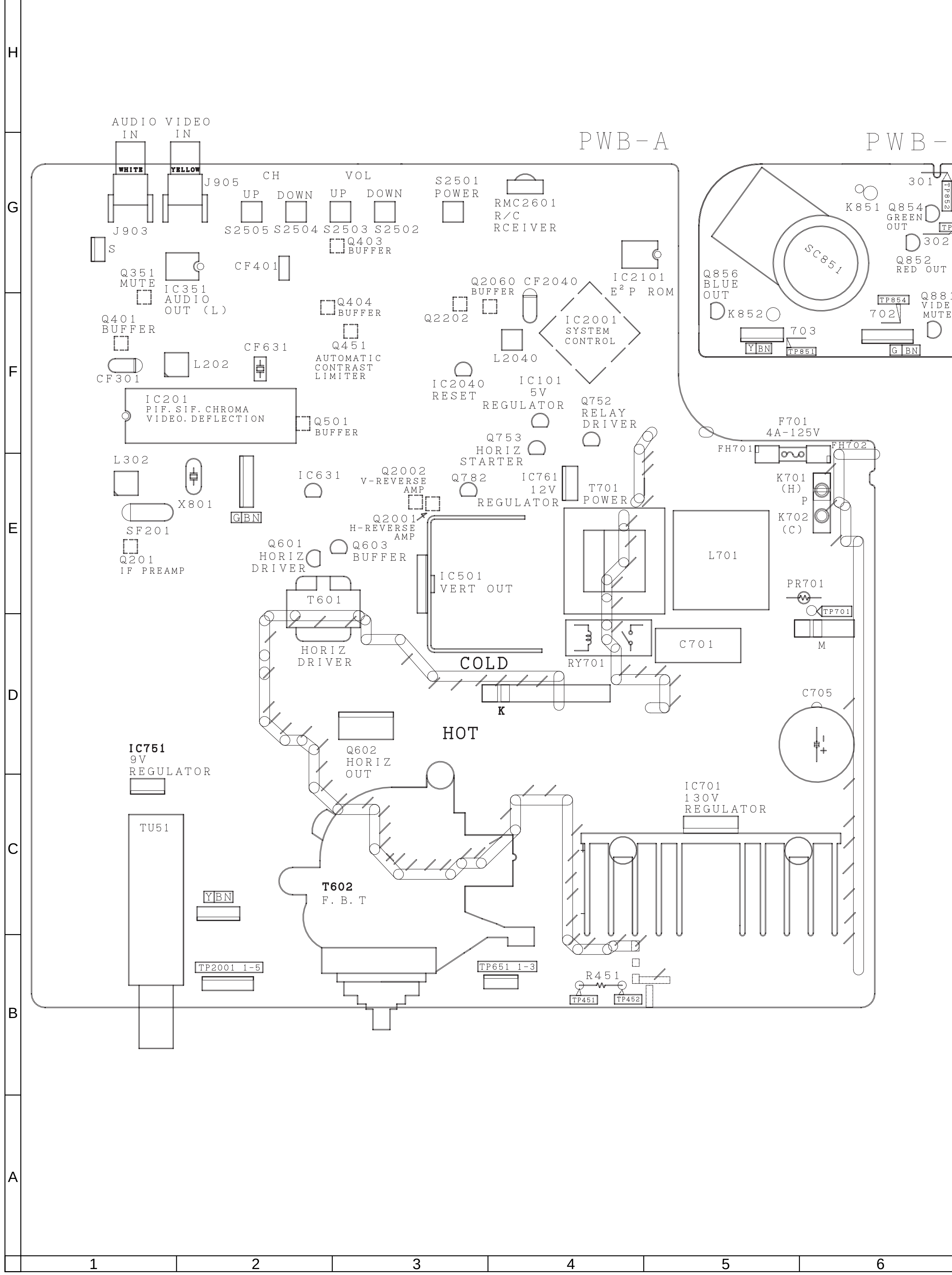


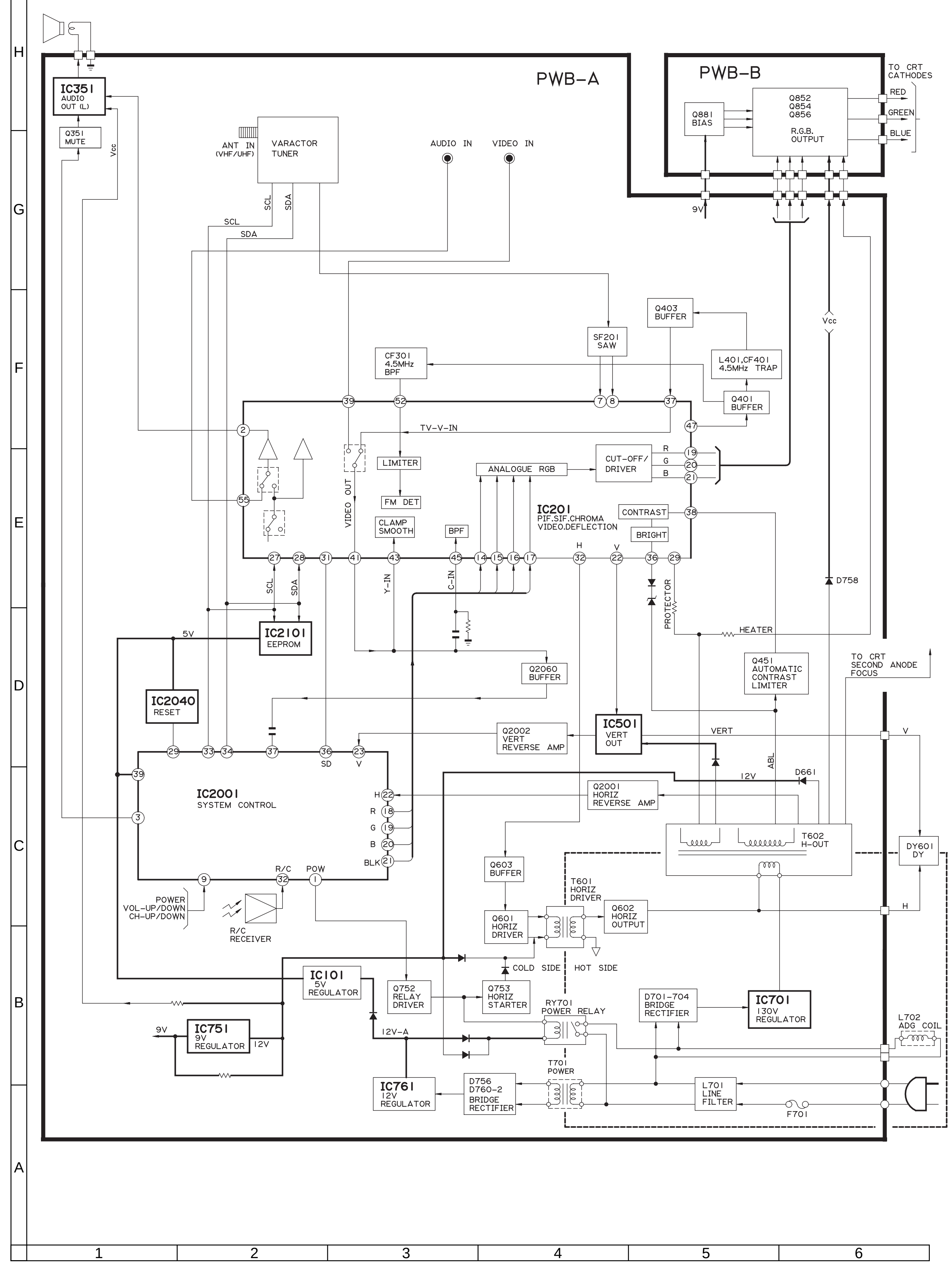
Figure C.

Memo

CHASSIS LAYOUT



BLOCK DIAGRAM



13K-M100/150
CK13M10/15

DESCRIPTION OF SCHEMATIC DIAGRAM

NOTE:

1. *The unit of resistance "ohm" is omitted (K:1000 ohms, M:1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *All capacitors are µ F, unless otherwise noted P: µµ F.*
4. *(G) indicates ±2% tolerance may be used.*
5. *⏚ indecates line isolated ground.*
6. *⏚ indecates hot ground.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.*
2. *All voltages measured with 1000µ V B & W or Color signal.*

WAVEFORM MEASUREMENT CONDITIONS:

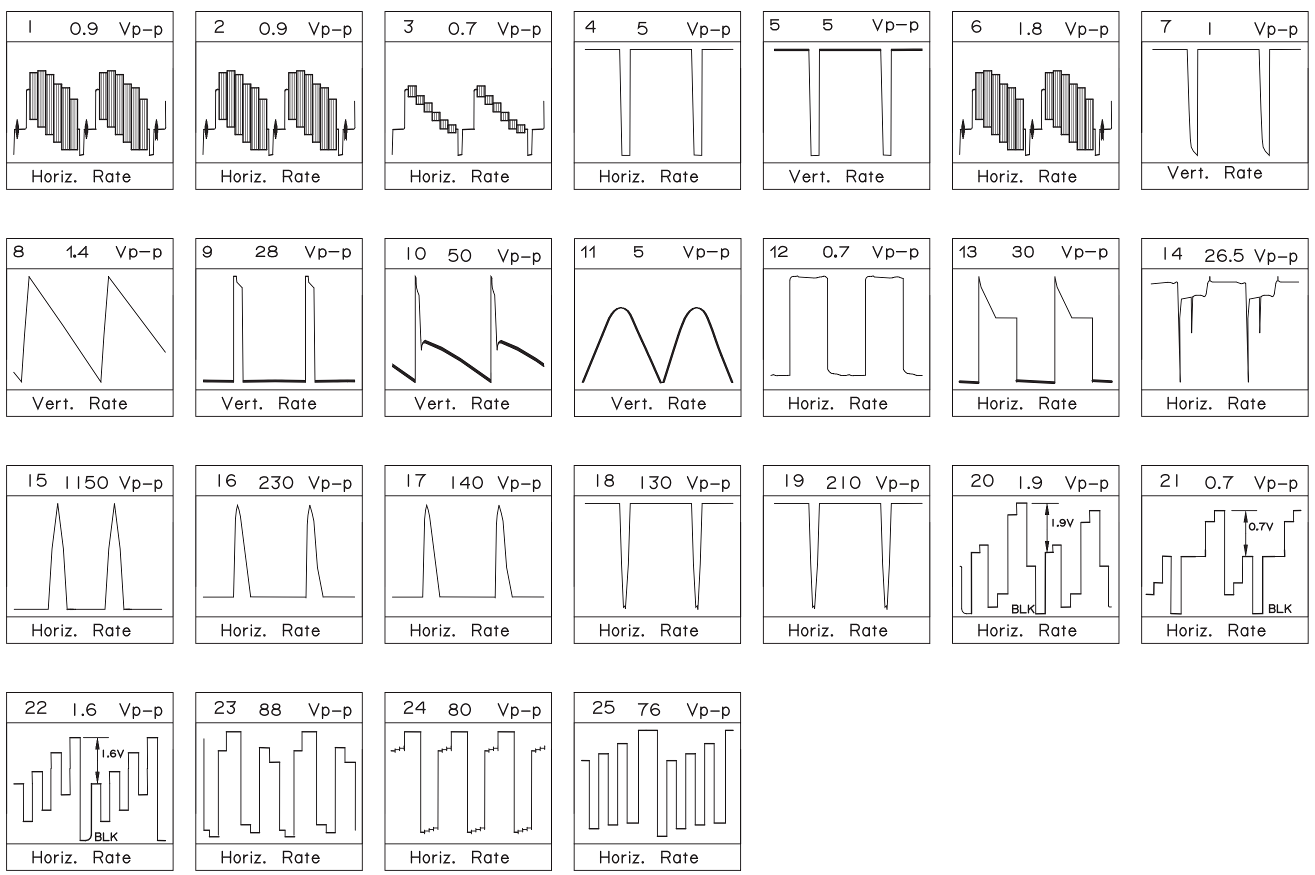
1. *Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.*
2. *⮞ indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)*

⚠ AND SHADED (▒) COMPONENTS = SAFETY RELATED PARTS.
▲ MARK= X-RAY RELATED PARTS.

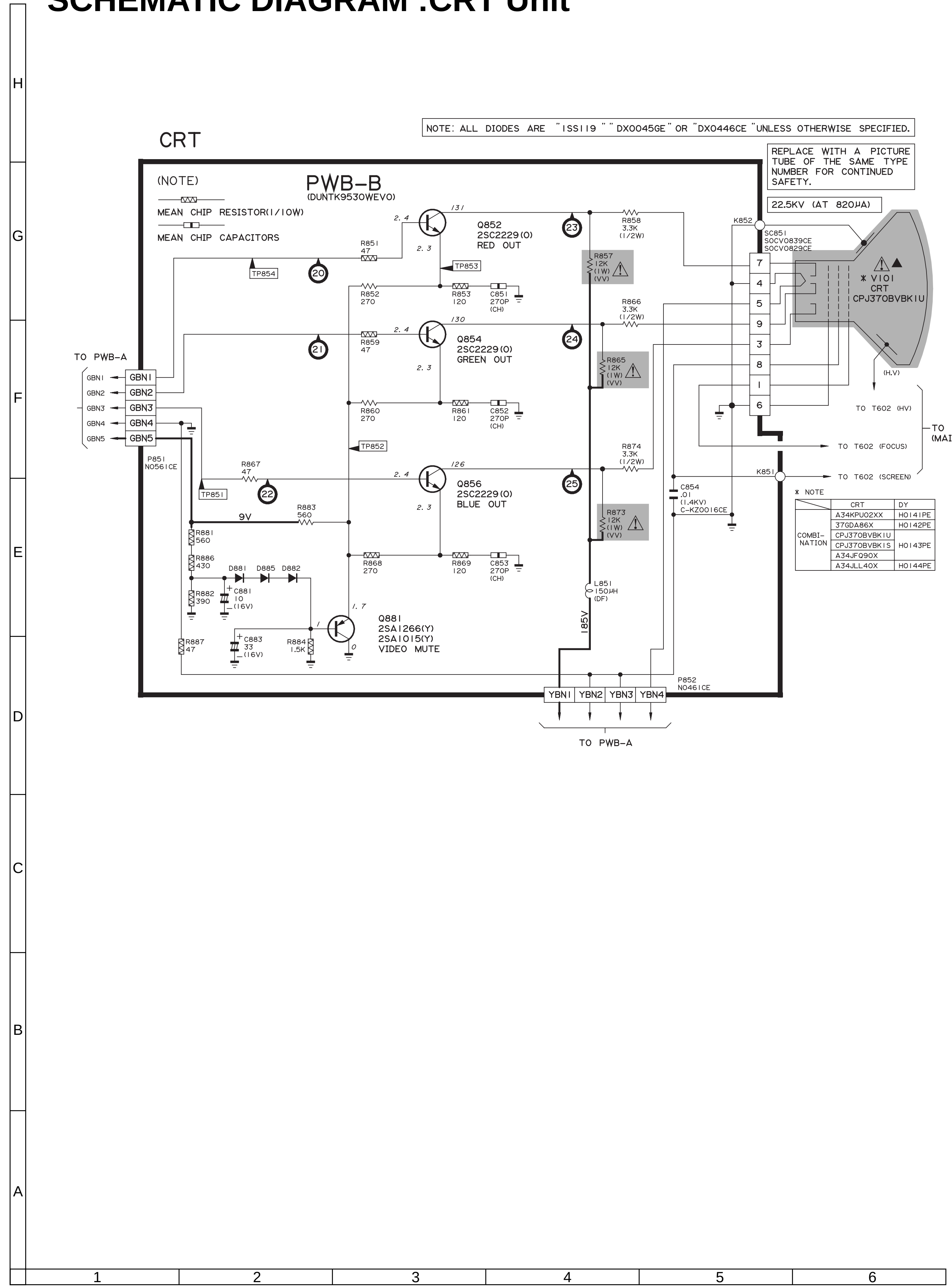
DRGANNES MARQUES ⚠ ET HACHRES (▒): PIECES RELATIVES A LA SECURITE.
MARQUE ▲ : PIECS RELATIVE AUX RAYONS X.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

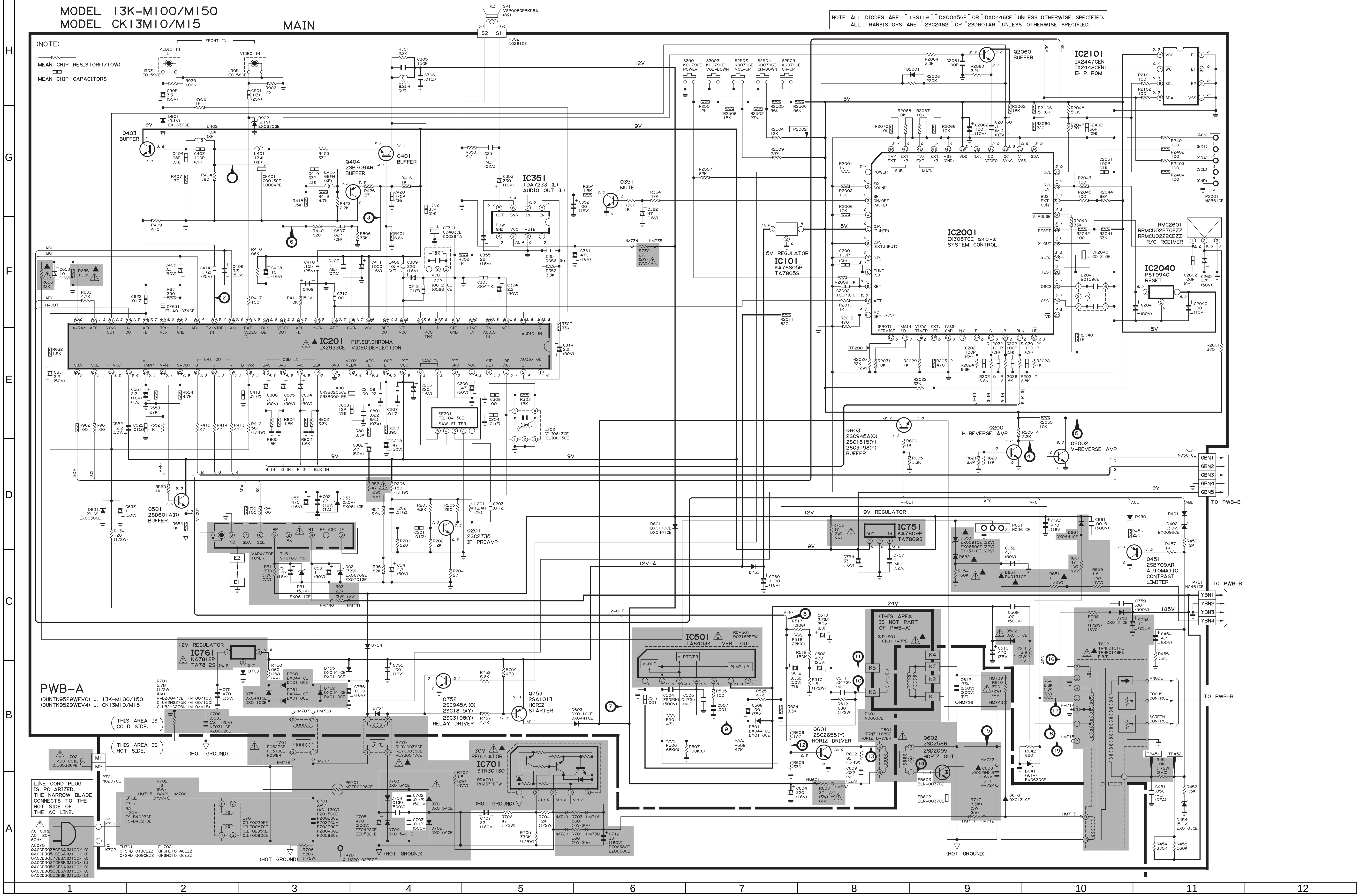
WAVEFORMS



SCHEMATIC DIAGRAM :CRT Unit

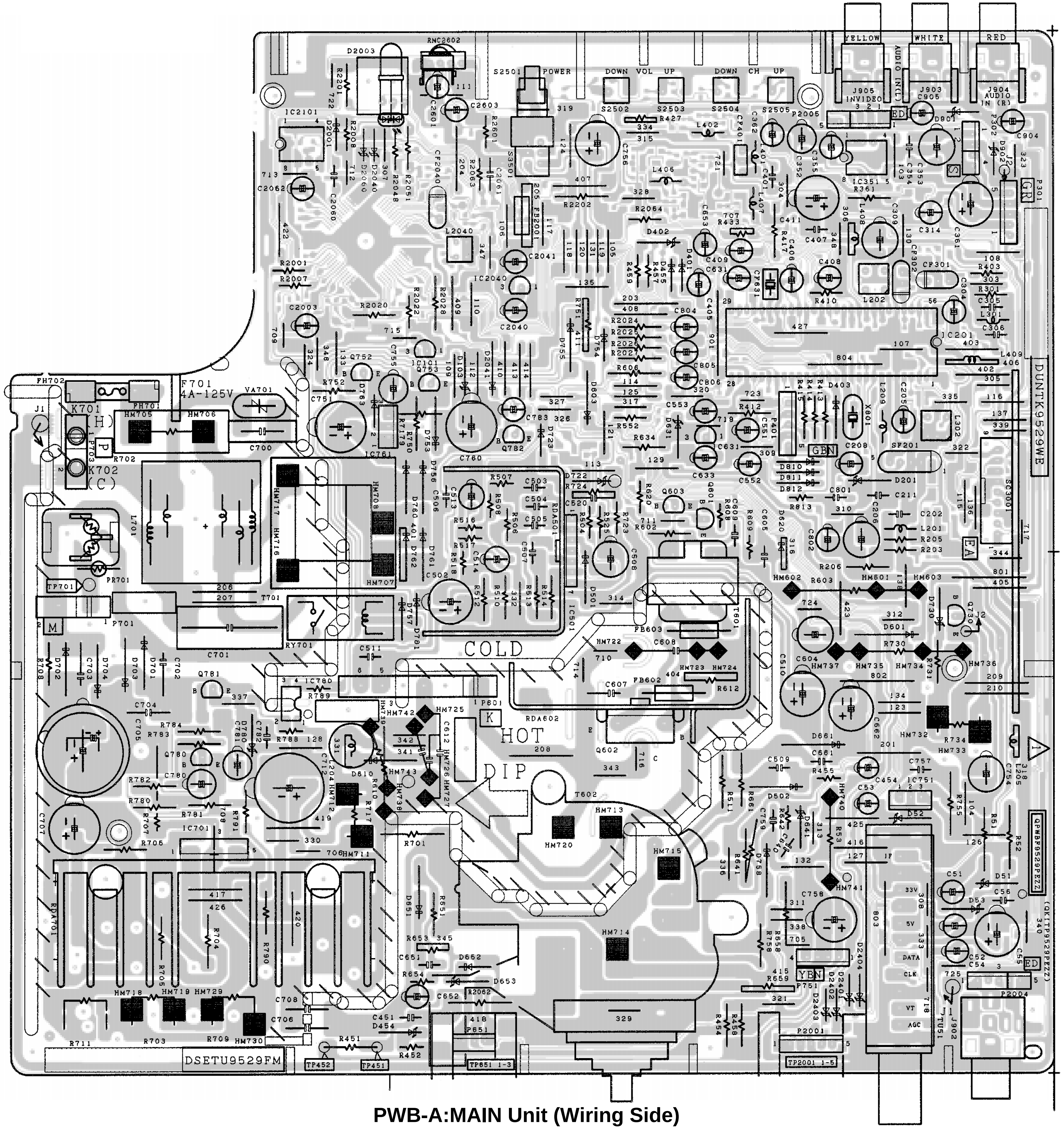


SCHEMATIC DIAGRAM:MAIN Unit

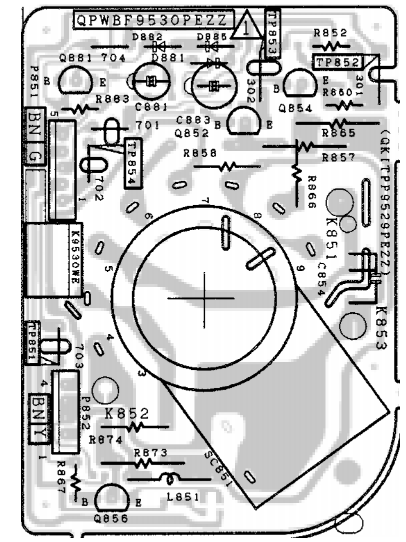


PRINTED WIRING BOARD ASSEMBLIES

H G F E D C B A



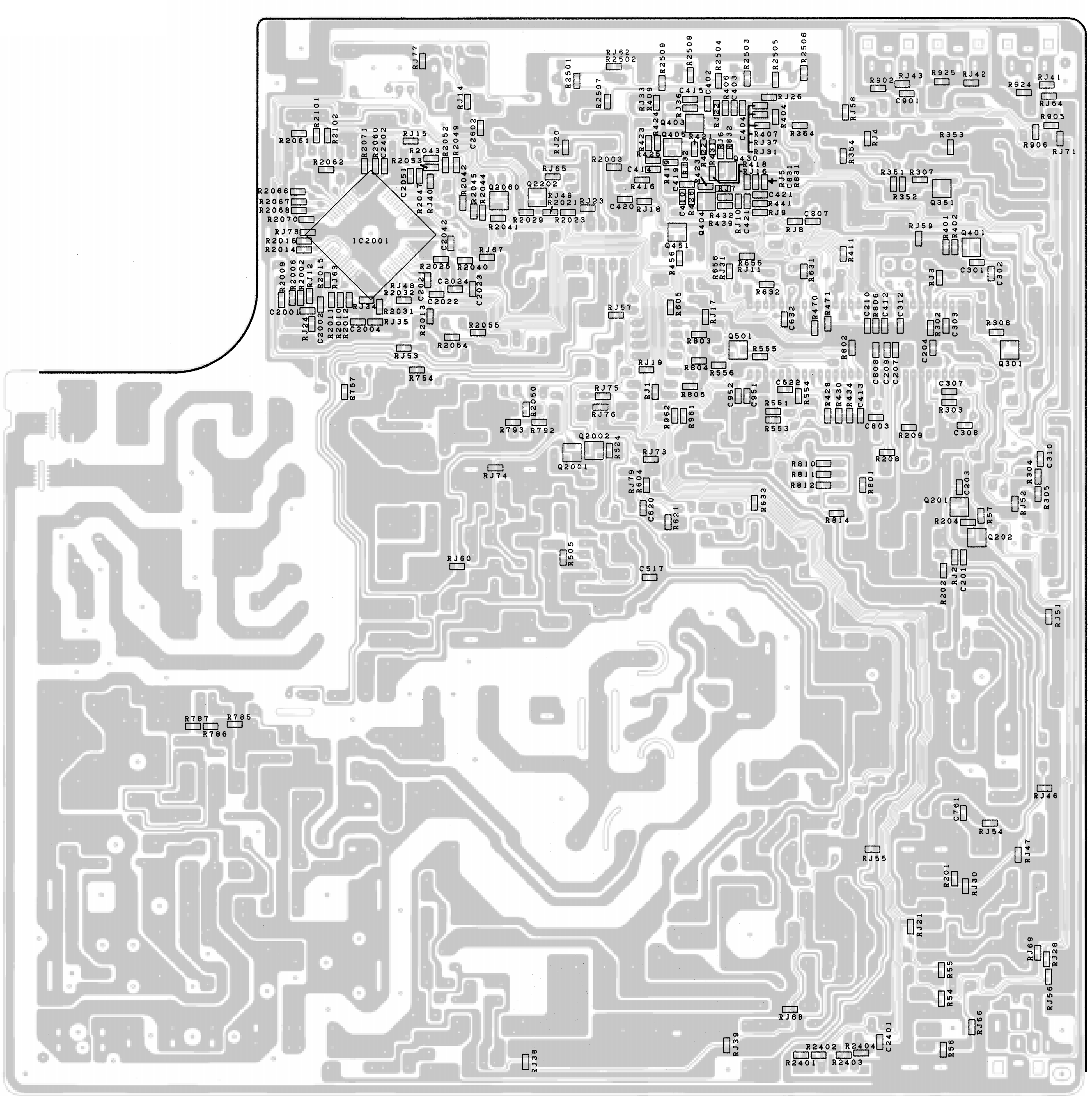
PWB-A:MAIN Unit (Wiring Side)



PWB-B:CRT Unit (Wiring Side)

1 2 3 4 5 6 7 8 9 10 11 12

H
G
F
E
D
C
B
A



PWB-A:MAIN Unit (Chip Parts Side)

1 2 3 4 5 6 7 8 9 10 11 12

13K-M100/150
CK13M10/15

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual ; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which dose no have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

in **USA**: Contact your nearest SHARP Parts Distributor to order. For location of SHARP Parts Distributor, Please call Toll-Free; 1-800-BE-SHARP

MARK★: SPARE PARTS-DELIVERY SECTION

MARK▲ : X- RAY RELATED PARTS

LISTE DES PIECES

CHANGE DES PIECES

Les pi`eces de rechange qui pr élelesent ces caract éleristiques sp éleciales de s élecurit éle, sont identifi élees dans ce manuel : les pi`eces élelectriques qui pr élesentent ces particularit éles, sont rep éler élee par la marque ⚠ et sont hachur élees dans les listes de pi`eces et dans les diagrammes sch élematiques.
La substitution d'une pi`ece de rechange par une autre qui ne pr éLesente pas les m éoemes caract éLeristiques de s élecurit éle que la pi`ece recommand élee parl'usine et dans ce manuel de service, peut provoquer une éLelectrocution, un incendie ou toutautre sinistre.

"COMMENT COMMANDER LES PIECES DE RECHANGE"

Pour que votre commande soit rapidement et correctement remplie, veuillez fournir les renseignements suivants.

1. NUMERO DU MODELE 2. NO. DE REF
3. NO. DE PIECE 4. DESCRIPTION

in **CANADE**: Contact SHARP Electronics of Conada Limited Phone (416) 890-2100

★MARQUE: SECTION LIVRAISON DES PIECES DE RECHANGE

▲ MARQUE : PIECES RELATIVE AUX RAYONS X

PICTURE TUBE

Ref. No.	Part No.	★	Description	Code
▲ ⚠V101	VB370BVBK1U-S	R	CRT (DY601:H0143PE)	BX
or	VB370BVBK1S-S	R	CRT (DY601:H0143PE)	BZ
or	VB34JFQ90X/*S	R	CRT(DY601:H0143PE)	CB
or	VB34KPU02X/*S	R	CR (DY601:H0141PE)	BX
or	VB34JLL40X/*S	R	CRT (DY601:H0144PE)	BX
or	VB37GDA86X/1E	R	CRT (DY601:H0142PE)	BX
▲ ⚠DY601	RCiLH0141PEZZ	R	DY (CRT:A34KPU02XX)	BA
or	RCiLH0142PEZZ	R	DY (CRT:37GDA86X)	AZ
or	RCiLH0143PEZZ	R	DY(CRT:CPJ370BVBK1UBC or CPJ370BVBK1S or A34JFQ90X)	
⚠L702	RCiLG0386PEZZ	R	Degaussing Coil	AK
	PMAGF3041CEZZ	J	Magnet Ass'y -Purity and Static Convergence	AG
	PSPAG0004PEZZ	R	Wedge (Gum),Yoke	AC
	QEARC1404PEZZ	R	Groundsing strap	AD
	MSPRT0001PEFJ	R	Spring for CRT	AC

PRINTED WIRING BOARD ASSEMBLIES

PWB-A	DUNTK9529WEV0	_	MAIN Unit (13K-M100/150)	_
PWB-A	DUNTK9529WEV4	_	MAIN Unit (CK13M10/15)	_
PWB-B	DUNTK9530WEV0	_	CRT Unit	_

DUNTK9529WEV0/V4
MAIN Unit

TUNER

NOTE:THE PARTS HERES SHOWN ARE SUPPLIED AS AN ASSEMBLY NOT INDEPENEDTLY.

Ref. No.	Part No.	★	Description	Code
⚠ TU51	VTUVTST6UF78/	J	Tuner	BD

INTEGRATED CIRCUITS

Ref. No.	Part No.	★	Description	Code
IC101	VHiKA78S05P-1	J	KiA78S05P	AD
or	VHiTA7805S/-1			
▲⚠ C201	RH-iX2933CEZZ	J	TA1268N	AX
IC351	VHiTDA7233/-1	J	TdA7233	AF
⚠ IC501	VHiTA8403K/-1	J	TA8403K	AL
▲⚠ IC701	VHiSTR301301E	J	I.C.	AP
⚠ IC751	VHiKA7809Pi-1	R	KiA7809Pi	AE
or	VHiTA7809S/-1			
⚠ IC761	VHiKA7812Pi-1	R	KiA7812Pi	AE
or	VHiTA7812S/-1			
IC2001	RH-iX3087CEZZ	J	I.C.	AV
IC2040	VHiPST994C/-1	J	PSt994C	AD
IC2101	RH-iX2447CEN1	J	ST24C01B6	AL
or	RH-iX2448CEN1			

TRANSISTORS

You can substitute "VS2SD601AR/-1" for "VS2SC2462-C-1".

Ref. No.	Part No.	★	Description	Code
Q201	VS2SC2735//1E	J	2SC2735	AC
Q351	VS2SD601AR/-1	J	2SD601	AC
Q401	VS2SD601AR/-1	J	2SD601	AC
Q403	VS2SD601AR/-1	J	2SD601	AC
Q404	VS2SB709AR/-1	J	2SB709	AC
Q451	VS2SB709AR/-1	J	2SB709	AC
Q501	VS2SD601AR/-1	J	2SD601	AC
Q601	VS2SC2655Y/-1	J	2SC2655	AE

DUNTK9529WEV0/V4
MAIN Unit (Continued)

Ref. No.	Part No.	★	Description	Code
⚠ Q602	VS2SD2586//1E	J	2SD2586	AM
or	VS2SD2095//1E			
Q603	VS2SC945AQ/-1	J	2SC945	AB
or	VS2SC1815YW-1			
or	VS2SC3198AQ/-1			
Q752	VS2SC945AQ/-1	J	2SC945	AB
Q753	VS2SA1013//1E	J	2SA1013	AD
Q2001	VS2SD601AR/-1	J	2SD601	AC
Q2002	VS2SD601AR/-1	J	2SD601	AC
Q2060	VS2SD601AR/-1	J	2SD601	AC

DIODES

You can substitute "RH-DX-446CEZZ" for "VHD1SS119//-1" and "RH-DX0045GEZZ".

Ref. No.	Part No.	★	Description	Code
D51	RH-EX0611GEZZ	J	Zener Diode	AA
D52	RH-EX0676GEZZ	J	Zener Diode	AA
or	RH-EX0701GEZZ			
D53	RH-EX0611GEZZ	J	Zener Diode	AA
D401	VHD1SS119//-1	J	Diode	AB
D402	RH-EX0092CEZZ	J	Zener Diode	AB
D454	RH-EX0103CEZZ	J	Zener Diode	AB
D455	VHD1SS119//-1	J	Diode	AB
D501	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
⚠ D502	RH-DX0131CEZZ	J	Diode	AC
D601	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
D603	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
D610	RH-DX0131CEZZ	J	Diode	AC
D631	RH-EX0630GEZZ	J	Zener Diode	AA
D641	RH-EX0630GEZZ	J	Zener Diode	AA
▲⚠ D651	RH-DX0131CEZZ	J	Diode	AC
▲⚠ D652	VHD1SS119//-1	J	Diode	AB
▲⚠ D653	RH-EX0091CEZZ	J	Zener Diode	AB
or	RH-EX0660GEZZ			
or	RH-EX1311CEZZ			
⚠ D661	RH-DX0444CEZZ	J	Diode	AH
⚠ D701	RH-DX0154CEZZ	J	Diode	AC
⚠ D702	RH-DX0154CEZZ	J	Diode	AC
⚠ D703	RH-DX0154CEZZ	J	Diode	AC
⚠ D704	RH-DX0154CEZZ	J	Diode	AC
D753	VHD1SS119//-1	J	Diode	AB
D754	VHD1SS119//-1	J	Diode	AB
D755	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
⚠ D756	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
D757	VHD1SS119//-1	J	Diode	AB
D758	RH-DX0131CEZZ	J	Diode	AC
⚠ D760	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
⚠ D761	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
⚠ D762	RH-DX0441CEZZ	J	Diode	AC
or	RH-DX0110CEZZ			
D763	VHD1SS119//-1	J	Diode	AB
D901	RH-EX0630GEZZ	J	Zener Diode	AA
D902	RH-EX0630GEZZ	J	Zener Diode	AA
D2001	VHD1SS119//-1	J	Diode	AB

PACKAGED CIRCUITS

Ref. No.	Part No.	★	Description	Code
⚠ PR701	RMPTP0026CEZZ	J	Packaged Circuit	AF
X801	RCRSB0001PEZZ	R	Crystal	AL
or	RCRSB0205CEZZ			

FILTERS

Ref. No.	Part No.	★	Description	Code
CF301	RFiLC0403CEZZ	J	Filter	AE
or	RFiLC0029TAZZ			
CF401	RFiLC0013CEZZ	J	Filter	AE
or	RFiLC0004PEZZ			
CF631	RFiLA0034CEZZ	J	Filter	AD
CF2040	RFiLC0121GEZZ	J	Filter	AD

COILS

Ref. No.	Part No.	★	Description	Code
L201	VP-XF1R2K0000	J	Peaking 1.2µH	AB
L202	RCiLi0612CEZZ	J	If Coil	AE
or	RCiLi0588CEZZ			
L301	VP-XF8R2K0000	J	Peaking 8.2µH	AB
L302	RCiLi0613CEZZ	J	If Coil	AE
or	RCiLi0605CEZZ			
L401	VP-XF120K0000	J	Peaking 12µH	AB
L402	VP-XF100K0000	J	Peaking 10µH	AB
L406	VP-XF680K0000	J	Peaking 68µH	AB
L408	VP-XF100K0000	J	Peaking 10µH	AB
⚠ L701	RCiLF0029PEZZ	R	Coil	AH
or	RCiLF0087CEZZ			
or	RCiLF0235CEZZ			
or	RCiLF0090CEZZ			
L2040	RCiLB0159CEZZ	J	Oscillation Coil	AE
SF201	RFiLC0405CEZZ	J	Filter	AH

TRANSFORMERS

Ref. No.	Part No.	★	Description	Code
⚠ T601	RTRNZ0168CEZZ	J	H-Driver	AH
▲⚠ T602	RTRNF0151PEZZ	R	H-out	BE
or	RTRNF0148PEZZ			
⚠ T701	RTRNP0527CEZZ	J	Power	AM
or	RTRNP0518CEZZ			

CAPACITORS

Ref. No.	Part No.	★	Description			Code
C51	VCEA0A1CW476M	J	47	16V	EL.	AB
C52	VCSATA1CE226K	J	22	16V	Tantalum	AD
C53	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C54	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C55	VCEA0A1CW477M	J	470	16V	EL.	AC
C201	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C202	VCKYPA1HF103Z	J	0.01	50V	Ceramic	AA
C203	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C204	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C205	VCEA0A1HW474M	J	0.47	50V	EL.	AB

DUNTK9529WEV0/V4
MAIN Unit (Continued)

Ref. No.	Part No.	★	Description			Code
C206	VCEA0A1CW227M	J	220	16V	EL.	AC
C207	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C208	VCEA0A1HW474M	J	0.47	50V	EL.	AB
C209	VCKYCY1HB222K	J	2200p	50V	Ceramic	AA
C210	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C302	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C303	VCKYCY1HB472K	J	4700p	50V	Ceramic	AA
C304	VCEA0A1HW225M	J	2.2	50V	EL.	AB
C305	VCKYPA1HB151K	J	150p	50V	Ceramic	AA
C306	VCKYPA1HF103Z	J	0.01	50V	Ceramic	AA
C308	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C309	VCEA0A1CW227M	J	220	16V	EL.	AC
C312	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C314	VCEA0A1HW225M	J	2.2	50V	EL.	AB
C351	VCKYCY1HB562K	J	5600p	50V	Ceramic	AA
C352	VCEA0A1CW107M	J	100	16V	EL.	AC
C353	VCEA0A1CW337M	J	330	16V	EL.	AC
C354	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
C355	VCEA0A1CW226M	J	22	16V	EL.	AB
C361	VCEA0A1CW477M	J	470	16V	EL.	AC
C362	VCEA0A1CW476M	J	47	16V	EL.	AB
C403	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C404	VCCCCY1HH680J	J	68p	50V	Ceramic	AA
C405	VCEA0A1HW335M	J	3.3	50V	EL.	AB
C406	VCEA0A1HW335M	J	3.3	50V	EL.	AB
C407	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
C408	VCEA0A1CW106M	J	10	16V	EL.	AB
C409	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C410	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C411	VCEAGA1CW108M	J	1000	16V	EL.	AD
C413	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C414	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C419	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C420	VCCCCY1HH471J	J	470p	50V	Ceramic	AA
C451	RC-QZA563TAYK	J	0.056	50V	Mylar	AB
C454	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C502	VCEA0A1EW477M	J	470	25V	EL.	AD
C504	VCKYPA2HB391K	J	390p	500V	Ceramic	AA
C505	VCQYTA1HM473K	J	0.047	50V	Mylar	AB
C507	VCKYPA1HB102K	J	1000p	50V	Ceramic	AA
C508	VCEAGA1VW107M	J	100	35V	EL.	AC
C509	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C510	VCEAGA1VW477M	J	470	35V	EL.	AD
C511	VCQYTA1HM473K	J	0.047	50V	Mylar	AB
C513	VCEACA1HC225M	J	2.2	50V	EL.	AC
C514	VCEACA1HC335J	J	3.3	50V	EL.	AC
C517	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C522	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C551	VCSATA1CE225K	J	2.2	16V	Tantalum	AB
C552	VCEA0A1HW225M	J	2.2	50V	EL.	AB
C604	VCEA0A1CW227M	J	220	16V	EL.	AC
▲⚠ C608	VCFPPD3CA522H	J	5200p	1600V	Metal.Poly.Film	AE
C609	RC-QZA223TAYK	J	0.022	50V	Mylar	AB
C612	VCFPPB2EB334J	J	0.33	250V	Metal.Poly.Film	AF
C631	VCEA0A1HW225M	J	2.2	50V	EL.	AB
C632	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C633	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C652	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C653	VCEA0A1CW106M	J	10	16V	EL.	AB
C661	VCKYPA2HB152K	J	1500p	500V	Ceramic	AA
C662	VCEA0A1CW477M	J	470	16V	EL.	AC
⚠ C701	RC-FZ015SCEZZ	J				AE
or	RC-FZ002SCEZZ					
or	RC-FZ004SGEZZ					
or	RC-FZ027CUMZZ					
or	RC-FZ059SCEZZ					
or	RC-FZ0279CEZZ					
C702	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
C703	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
C704	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
⚠ C705	RC-EZ0422CEZZ	J	470	200V	EL.	AN
or	RC-EZ0522CEZZ					
⚠ C706	RC-KZ0092GEZZ	J	0.0033	AC125V	Ceramic	AC
or	RC-KZ0311CEZZ					
⚠ C707	VCEAGA2CW226M	J	22	160V	EL.	AD
C712	RC-EZ0638CEZZ	J	33	160V	EL.	AG
or	RC-EZ0658CEZZ					
C751	VCEA0A1VW477M	J	470	35V	EL.	AB
C754	VCEA0A1CW337M	J	330	16V	EL.	AC
C755	VCEA0A1CW107M	J	100	16V	EL.	AC
C756	VCEAGA1CW108M	J	1000	16V	EL.	AD
C757	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
⚠ C758	VCEAGA2EW106M	J	10	250V	EL.	AC
C759	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C760	VCEAGA1CW108M	J	1000	16V	EL.	AD
C801	RC-QZA223TAYK	J	0.022	50V	Mylar	AB
C802	VCEA0A1HW474M	J	0.47	50V	EL.	AB
C803	VCCCCY1HH120J	J	12p	50V	Ceramic	AA
C804	VCEA0A1HW104M	J	0.1	50V	EL.	AB
C805	VCEA0A1HW104M	J	0.1	50V	EL.	AB
C806	VCEA0A1HW104M	J	0.1	50V	EL.	AB
C807	VCCCCY1HH820J	J	82p	50V	Ceramic	AA
C901	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C905	VCEA0A1HW335M	J	3.3	50V	EL.	AB
C2001	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2002	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2021	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2022	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2023	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2024	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2040	VCEA0A1AW107M	J	100	10V	EL.	AB
C2041	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C2051	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C2060	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
C2061	VCKYD41HB101K	J	100p	50V	Ceramic	AA
C2062	VCEA0A1AW107M	J	100	10V	EL.	AB
C2402	VCCCCY1HH560J	J	56p	50V	Ceramic	AA
C2601	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C2602	VCCCCY1HH101J	J	100p	50V	Ceramic	AA

DUNTK9529WEV0/V4

MAIN Unit (Continued)

RESISTORS

Ref. No.	Part No.	★	Description	Code
RJ1	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ3	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ5	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ6	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ7	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ9	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ10	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ12	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ15	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ17	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ18	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ19	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ20	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ21	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ23	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ24	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ26	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ30	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ31	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ32	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ35	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ40	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ47	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ49	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ52	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ55	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ57	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ59	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ62	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ63	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ66	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ67	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ68	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ71	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ75	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ77	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ78	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
RJ79	VRN-MD2AL000J	J	00 0.1W Metal.Film	AA
⚠ R51	VRS-VV3AB331J	J	330 1W Metal.Oxide	AA
⚠ R52	VRS-VV3DB470J	J	47 2W Metal.Oxide	AA
⚠ R53	VRS-VV3LB223J	J	22k 3.0W Metal.Oxide	AB
R54	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
R55	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
R56	VRN-MD2AL823J	J	82k 0.1W Metal.Film	AA
R57	VRN-MD2AL392J	J	3.9k 0.1W Metal.Film	AA
R201	VRN-MD2AL221J	J	220 0.1W Metal.Film	AA
R202	VRN-MD2AL122J	J	1.2k 0.1W Metal.Film	
R203	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R204	VRN-MD2AL270J	J	27 0.1W Metal.Film	AA
R205	VRD-RA2BE391J	J	390 1/8W Carbon	AA
R206	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R208	VRN-MD2AL391J	J	390 0.1W Metal.Film	AA
R301	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R302	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
R303	VRN-MD2AL153J	J	15k 0.1W Metal.Film	AA
R307	VRN-MD2AL333J	J	33k 0.1W Metal.Film	AA
R352	VRN-MD2AL332J	J	3.3k 0.1W Metal.Film	AA
R353	VRN-MD2AL4R7J	J	4.7 0.1W Metal.Film	AA
R354	VRN-MD2AL152J	J	1.5k 0.1W Metal.Film	AA
R361	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R364	VRN-MD2AL473J	J	47k 0.1W Metal.Film	AA
R401	VRN-MD2AL682J	J	6.8k 0.1W Metal.Film	AA
R403	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R404	VRN-MD2AL391J	J	390 0.1W Metal.Film	AA
R407	VRN-MD2AL471J	J	470 0.1W Metal.Film	AA
R409	VRN-MD2AL471J	J	470 0.1W Metal.Film	AA
R410	VRD-RA2BE563J	J	56k 1/8W Carbon	AA
R411	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
R412	VRD-RA2EE561J	J	560 1/4W Carbon	AA
R413	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R414	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R415	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R416	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
R417	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R418	VRN-MD2AL152J	J	1.5k 0.1W Metal.Film	AA
R419	VRN-MD2AL472J	J	4.7k 0.1W Metal.Film	AA
R423	VRN-MD2AL222J	J	2.2k 0.1W Metal.Film	AA
R426	VRN-MD2AL271J	J	270 0.1W Metal.Film	AA
R440	VRN-MD2AL821J	J	820 0.1W Metal.Film	AA
⚠ R451	VRS-SV2HC103J	J	10k 1/2W Metal.Oxide	AA
R452	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R454	VRD-RA2BE334J	J	330k 1/8W Carbon	AA
R455	VRD-RA2BE392J	J	3.9k 1/8W Carbon	AA
R456	VRN-MD2AL223J	J	22k 0.1W Metal.Film	AA
R457	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R458	VRD-RA2BE564J	J	560k 1/8W Carbon	AA
R459	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R504	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R505	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
R506	VRD-RA2BE683G	J	68k 1/8W Carbon	AA
R507	VRD-RA2BE104G	J	100k 1/8W Carbon	AA
R508	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R510	VRD-RM2HD1R5J	J	1.5 1/2W Carbon	AA
⚠ R511	VRN-SV2HB3R9J	J	3.9 1/2W Metal.Film	AB
R512	VRD-RM2HD681J	J	680 1/2W Carbon	AA
R516	VRD-RA2BE223G	J	22k 1/8W Carbon	AA
R517	VRD-RA2BE103G	J	10k 1/8W Carbon	AA
R518	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
R524	VRN-MD2AL332J	J	3.3k 0.1W Metal.Film	AA
R525	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R552	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R553	VRN-MD2AL273J	J	27k 0.1W Metal.Film	AA
R554	VRN-MD2AL472J	J	4.7k 0.1W Metal.Film	AA
R555	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
R556	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
R602	VRD-RA2EE820J	J	82 1/4W Carbon	AA
⚠ R603	VRS-VV3LB270J	J	27 3.0W Metal.Oxide	AB
R605	VRN-MD2AL332J	J	3.3k 0.1W Metal.Film	AA

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MAIN Unit (Continued)

	Ref. No.	Part No.	★	Description	Code
	R606	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
	R608	VRD-RA2BE101J	J	100 1/8W Carbon	AB
	R609	VRD-RA2BE331J	J	330 1/8W Carbon	AA
⚠	R610	VRS-VV3DB391J	J	390 2W Metal.Oxide	AA
	R620	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
	R621	VRN-MD2AL682J	J	6.8k 0.1W Metal.Film	AA
	R631	VRN-MD2AL391J	J	390 0.1W Metal.Film	AA
	R632	VRN-MD2AL152J	J	1.5k 0.1W Metal.Film	AA
	R633	VRN-MD2AL472J	J	4.7k 0.1W Metal.Film	AA
	R634	VRD-RM2HD121J	J	120 1/2W Carbon	AA
⚠	R641	VRS-VV3AB682J	J	6.8k 1W Metal.Oxide	AA
	R642	VRD-RA2BE821J	J	820 1/8W Carbon	AA
▲⚠	R651	VRD-RM2HD1R0J	J	1.0 1/2W Carbon	AA
▲⚠	R654	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
▲⚠	R655	VRN-MD2AL104J	J	100k 0.1W Metal.Film	AA
▲⚠	R656	VRN-MD2AL333J	J	33k 0.1W Metal.Film	AA
⚠	R659	VRN-VV3AB1R8J	J	1.8 1W Metal.Film	AA
⚠	R661	VRN-VV3ABR47J	J	0.47 1W Metal.Film	AA
⚠	R701	VRC-UA2HG275K	J	2.7M 1/2W Solid 13K-M100/150	AA
⚠	R701	VRC-UB2HG275K	J	2.7M 1/2W Solid CK13M10/15	AF
⚠	R702	VRW-KP3HC1R8K	J	1.8 5W Cement	AC
⚠	R703	VRS-KA3NG561J	J	560 7.0W Metal.Oxide	AF
	R704	VRD-RM2HD123J	J	12k 1/2W Carbon	AA
	R705	VRD-RA2EE334J	J	330k 1/4W Carbon	AA
	R706	VRD-RM2HD470J	J	47 1/2W Carbon	AA
⚠	R707	VRN-VV3DB1R5J	J	1.5 2W Metal.Film	AB
	R708	VRD-RM2HD824J	J	820k 1/2W Carbon	AA
⚠	R709	VRS-KA3NG561J	J	560 7.0W Metal.Oxide	AF
⚠	R717	VRS-KA3HG3R3K	J	3.3 5W Metal.Oxide	AD
⚠	R730	VRS-VV3DB270J	J	27 2W Metal.Oxide	AA
⚠	R750	VRS-VV3AB561J	J	560 1W Metal.Oxide	AA
	R752	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
	R754	VRN-MD2AL471J	J	470 0.1W Metal.Film	AA
⚠	R755	VRS-VV3DB470J	J	47 2W Metal.Oxide	AA
	R757	VRN-MD2AL472J	J	4.7k 0.1W Metal.Film	AA
⚠	R758	VRS-SV2HC150J	J	15 1/2W Metal.Oxide	AA
	R801	VRN-MD2AL332J	J	3.3k 0.1W Metal.Film	AA
	R802	VRN-MD2AL332J	J	3.3k 0.1W Metal.Film	AA
	R803	VRN-MD2AL182J	J	1.8k 0.1W Metal.Film	AA
	R804	VRN-MD2AL182J	J	1.8k 0.1W Metal.Film	AA
	R805	VRN-MD2AL182J	J	1.8k 0.1W Metal.Film	AA
	R806	VRN-MD2AL333J	J	33k 0.1W Metal.Film	AA
	R902	VRN-MD2AL750J	J	75 0.1W Metal.Film	AA
	R906	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
	R925	VRN-MD2AL104J	J	100k 0.1W Metal.Film	AA
	R961	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R962	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2001	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
	R2002	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2006	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2008	VRD-RA2BE224J	J	220k 1/8W Carbon	AA
	R2009	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
	R2010	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
	R2011	VRN-MD2AL821J	J	820 0.1W Metal.Film	AA
	R2012	VRN-MD2AL471J	J	470 0.1W Metal.Film	AA
	R2020	VRD-RM2HD223J	J	22k 1/2W Carbon	AA
	R2022	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
	R2024	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
	R2025	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
	R2026	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
	R2027	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
	R2028	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
	R2029	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
	R2031	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2032	VRN-MD2AL471J	J	470 0.1W Metal.Film	AA
	R2040	VRN-MD2AL102J	J	1.0k 0.1W Metal.Film	AA
	R2041	VRN-MD2AL333J	J	33k 0.1W Metal.Film	AA
	R2042	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2043	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2044	VRN-MD2AL683J	J	68k 0.1W Metal.Film	
	R2045	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2047	VRN-MD2AL221J	J	220 0.1W Metal.Film	AA
	R2048	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
	R2049	VRN-MD2AL333J	J	33k 0.1W Metal.Film	AA
	R2054	VRN-MD2AL222J	J	2.2k 0.1W Metal.Film	AA
	R2055	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2060	VRN-MD2AL221J	J	220 0.1W Metal.Film	AA
	R2061	VRN-MD2AL562J	J	5.6k 0.1W Metal.Film	AA
	R2062	VRN-MD2AL183J	J	18k 0.1W Metal.Film	AA
	R2063	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
	R2064	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
	R2066	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2067	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2068	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2070	VRN-MD2AL103J	J	10k 0.1W Metal.Film	AA
	R2101	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2102	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2401	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2402	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2403	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2404	VRN-MD2AL101J	J	100 0.1W Metal.Film	AA
	R2501	VRN-MD2AL123J	J	12k 0.1W Metal.Film	AA
	R2503	VRN-MD2AL273J	J	27k 0.1W Metal.Film	AA
	R2504	VRN-MD2AL123J	J	12k 0.1W Metal.Film	AA
	R2505	VRN-MD2AL563J	J	56k 0.1W Metal.Film	AA
	R2506	VRN-MD2AL563J	J	56k 0.1W Metal.Film	AA
	R2507	VRN-MD2AL823J	J	82k 0.1W Metal.Film	AA
	R2508	VRN-MD2AL153J	J	15k 0.1W Metal.Film	AA
	R2509	VRN-MD2AL272J	J	2.7k 0.1W Metal.Film	AA
	R2601	VRD-RA2BE331J	J	330 1/8W Carbon	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
S2501	QSW-K0079GEZZ	J	Switch, Power	AB
S2502	QSW-K0079GEZZ	J	Switch, Vol-down	AB
S2503	QSW-K0079GEZZ	J	Switch, Vol-up	AB
S2504	QSW-K0079GEZZ	J	Switch, CH-down	AB
S2505	QSW-K0079GEZZ	J	Switch, CH-up	AB

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MAIN Unit (Continued)

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠ RY701	RRLYU0036CEZZ	J	Relay	AM
or	RRLYU0038CEZZ			
or	RRLYJ0077CEZZ			
⚠ F701	QFS-B4023CEZZ	J	Fuse	AC
or	QFS-B4021GEZZ			
FB602	RBLN-0037CEZZ	J	Balun	AB
FB603	RBLN-0037CEZZ	J	Balun	AB
FH701	QFSHD1013CEZZ	J	Fuse Holder	AC
FH702	QFSHD1014CEZZ	J	Fuse Holder	AC
J903	QJAKE0159CEZZ	J	Jack	AF
J905	QJAKE0158CEZZ	J	Jack	AF
P302	QPLGN0261CEZZ	J	Plug	AB
P401	QPLGN0561CEZZ	J	Plug	AB
P601	QPLGN0603CEZZ	J	Plug	AB
P651	QPLGN0361CEZZ	J	Plug	AB
P701	QPLGN0207CEZZ	J	Plug	AA
P751	QPLGN0461CEZZ	J	Plug	AB
P2001	QPLGN0561CEZZ	J	Plug	AB
RMC2601	RRMCU0227CEZZ	J	Remote Receiver	AK
or	RRMCU0222CEZZ			
RDA501	PRDAR0218PEFW	R	Heat Sink	AD
RDA701	PRDAR0237PEFW	R	Heat Sink	AK
TP701	QLUGP0102PEZZ	R	Lug	AA
	PZETM0016CEZZ	J	Insulator	AA

DUNTK9530WEV0
CRT Unit

TRANSISTORS

Ref. No.	Part No.	★	Description	Code
Q852	VS2SC2229O/1E	J	2SC2229 (O)	AD
Q854	VS2SC2229O/1E	J	2SC2229 (O)	AD
Q856	VS2SC2229O/1E	J	2SC2229 (O)	AD
Q881	VS2SA1266-Y-1	J	2SA1266 (Y)	AA
or	VS2SA1015-Y-1			

DIODES

You can substitute "RH-DX-446CEZZ" for "VHD1SS119//-1" and "RH-DX0045GEZZ".

Ref. No.	Part No.	★	Description	Code
D881	VHD1SS119//-1	J	Diode	AB
D882	VHD1SS119//-1	J	Diode	AB
D885	VHD1SS119//-1	J	Diode	AB

COILS AND CAPACITORS

Ref. No.	Part No.	★	Description	Code
L851	VP-DF151K0000	J	Peaking 150µH	AB
C851	VCCCCY1HH271J	J	270p 50V Ceramic	AA
C852	VCCCCY1HH271J	J	270p 50V Ceramic	AA
C853	VCCCCY1HH271J	J	270p 50V Ceramic	AA
C854	RC-KZ0016CEZZ	J	0.01 1.4kV Ceramic	AC
C881	VCEA0A1CW106M	J	10 16V Electrolytic	AB
C883	VCEA0A1CW336M	J	33 16V Electrolytic	AB

RESISTORS

Ref. No.	Part No.	★	Description	Code
R851	VRN-MD2AL470J	J	47 0.1W Metal.Film	AA
R852	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R853	VRN-MD2AL121J	J	120 0.1W Metal.Film	AA
⚠ R857	VRS-VV3AB123J	J	12k 1W Metal.Oxide	AA
R858	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R859	VRN-MD2AL470J	J	47 0.1W Metal.Film	AA
R860	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R861	VRN-MD2AL121J	J	120 0.1W Metal.Film	AA
⚠ R865	VRS-VV3AB123J	J	12k 1W Metal.Oxide	AA
R866	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R867	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R868	VRN-MD2AL271J	J	270 0.1W Metal.Film	AA
R869	VRN-MD2AL121J	J	120 0.1W Metal.Film	AA
⚠ R873	VRS-VV3AB123J	J	12k 1W Metal.Oxide	AA
R874	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R881	VRN-MD2AL561J	J	560 0.1W Metal.Film	AA
R882	VRN-MD2AL391J	J	390 0.1W Metal.Film	AA
R883	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R884	VRN-MD2AL152J	J	1.5k 0.1W Metal.Film	AA
R886	VRN-MD2AL431J	J	430 0.1W Metal.Film	AA
R887	VRN-MD2AL470J	J	47 0.1W Metal.Film	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
P851	QPLGN0561CEZZ	J	Plug	AB
P852	QPLGN0461CEZZ	J	Plug	AB
SC851	QSOCV0839CEZZ	J	CRT Socket	AK
or	QSOCV0829CEZZ			

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
SP1	VSP0080PBK58A	J	Speaker	AL
⚠ ACC701	QACCD3038CESA		AC Cord (13K-M100/CK13M10)	AK
or	QACCD3051CESA			
or	QACCD3037CESA			
or	QACCD3056CESA			
or	QACCD3055CESA			
⚠ ACC701	QACCD3037CESB		AC Cord (13K-M150/CK13M15)	AK
or	QACCD3055CESB			
	QCNW-2105PEZZ	R	Connecting Cord	AF
	QCNW-2106PEZZ	R	Connecting Cord	AE
	QCNW-2107PEZZ	R	Connecting Cord	AE
	QANTR0022PEZZ	R	Rod Antenna	AP

CABINET PARTS

13K-M100

Ref. No.	Part No.	★	Description	Code
1	CCABA2395WEV0	R	Cabinet Ass'y,Front	AZ
1-1	_	_	Cabinet Front	
1-2	GCOVA0078PEKA	R	Cover	AD
1-3	JBTN-0258PESA	R	Button	AE
2	GCABB2309PEKA	R	Cabinet	AW

13K-M150

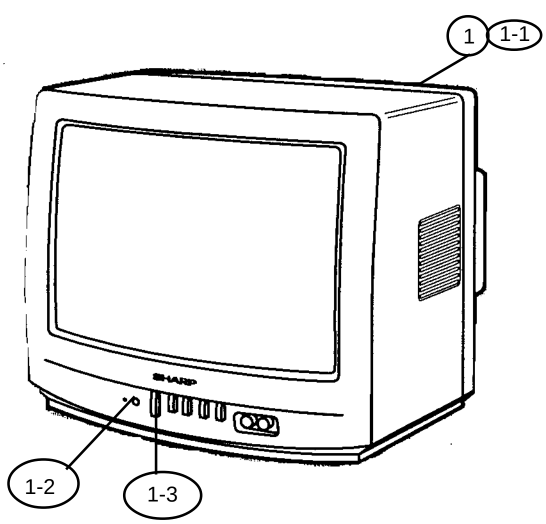
Ref. No.	Part No.	★	Description	Code
1	CCABA2395WEV2	R	Cabinet Ass'y,Front	AZ
1-1	_	_	Cabinet Front	
1-2	GCOVA0078PEKA	R	Cover	AD
1-3	JBTN-0258PESB	R	Button	AR
2	GCABB2309PEKB	R	Cabinet	AW

CK13M10

Ref. No.	Part No.	★	Description	Code
1	CCABA2409WEVO	R	Cabinet Ass'y,Front	AZ
1-1	_	_	Cabinet Front	
1-2	GCOVA0078PEKA	R	Cover	AD
1-3	JBTN-0258PESA	R	Button	AE
2	GCABB2325PEKA	R	Cabinet	AW

CK13M15

Ref. No.	Part No.	★	Description	Code
1	CCABA2409WEV2	R	Cabinet Ass'y,Front	AZ
1-1	_	_	Cabinet Front	
1-2	GCOVA0078PEKA	R	Cover	AD
1-3	JBTN-0258PESA	R	Button	AE
2	GCABB2325PEKB	R	Cabinet	AW



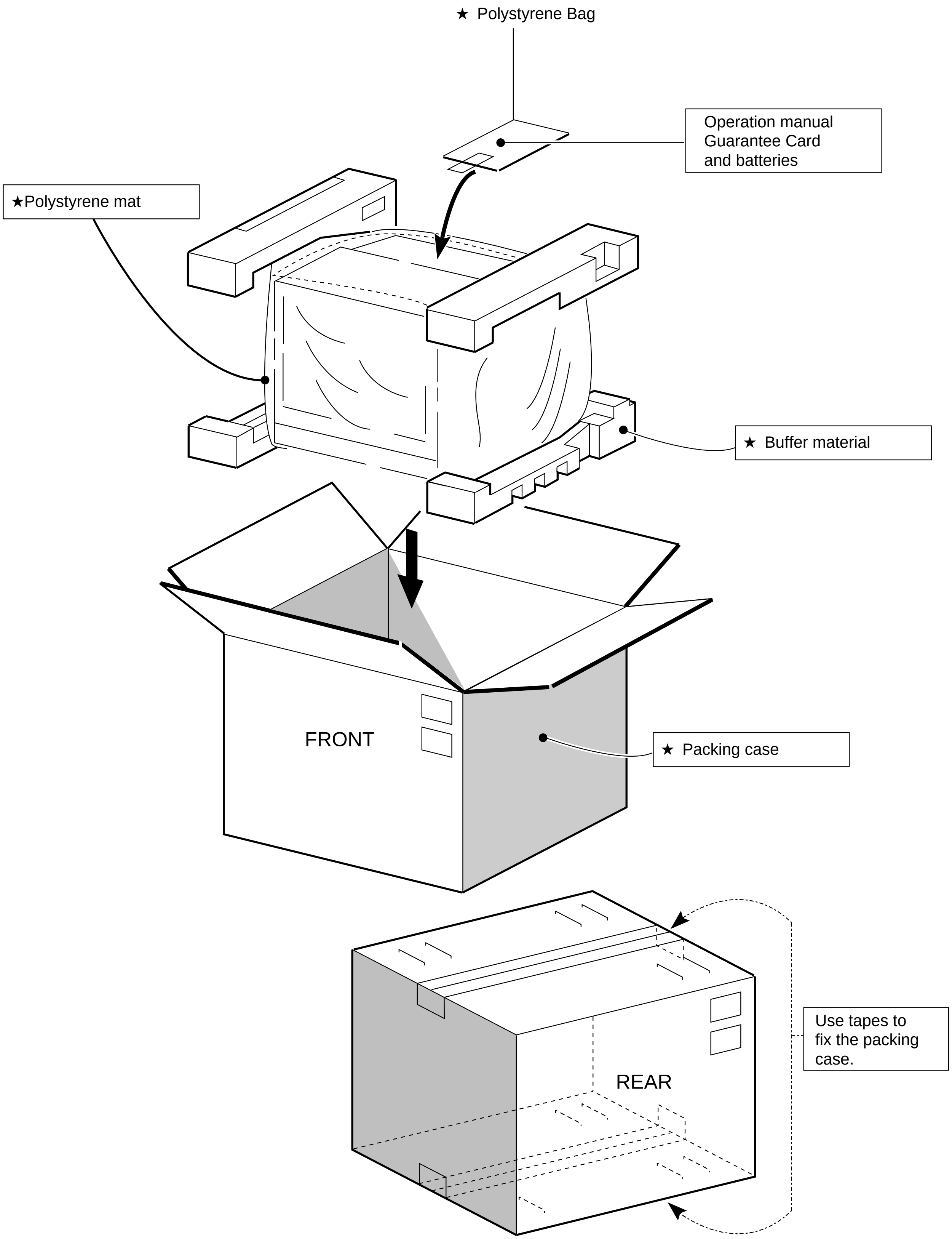
SUPPLIED ACCESSORIES

Ref. No.	Part No.	★	Description	Code
	RRMCG1324CESA	R	Infrared R-C (13K-M100/ CK13M10)	AT
	RRMCG1324CESB	R	Infrared R-C (13K-M150 CK13M15)	AT
	TGAN-0018PEZZ	R	Guarantee Card	AD
	TiNS-6317PEZZ	R	Operation Manual (13KM100/150)	AE
	TiNS-6353PEZZ	R	Operation Manual (CK13M10/15)	AE

PACKING PARTS
(NOT REPLACEMENT ITEM)

Ref. No.	Part No.	★	Description	Code
	SPAKC6303PEZZ	_	Packing Case (13KM100)	_
	SPAKC6319PEZZ		(13KM150)	
	SPAKC6323PEZZ	_	Packing Case (CK13M10)	_
	SPAKC6339PEZZ		(CK13M15)	
	SPAKP0031PEZZ	_	Wrapping Paper	_
	SPAKP0110PEZZ	_	Wrapping Paper	_
	SPAKX2630PEZZ	_	Packing Add.	_
	SSAKA0001PEZZ	_	Polyethylene Bag	_

PACKING OF THE SET



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